MOTOROLA

March 7, 1995

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Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Suite 222
Washington, D.C. 20554

RE: IC Docket No. 94-31

Dear Mr. Caton:

Transmitted herewith are an original and nine copies of a corrected version of the Comments of Motorola, Inc. filed yesterday in response to the Commission's Second Notice of Inquiry in the above-referenced proceeding on preparations for WRC-95. Due to word processing problems encountered late yesterday afternoon, we were unable to make certain non-substantive corrections and to adjust the footnote numbering. For convenience and ease of reading, Motorola is resubmitting a complete version of its Comments as corrected.

Should any questions arise concerning this matter, please contact the undersigned.

Respectfully submitted,

Barry Lambergman

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Manager, Satellite Regulatory Affairs

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of

Preparation for International Telecommunication Union World Radiocommunication Conferences	))))	IC Docket No. 94-31

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COMMENTS OF MOTOROLA, INC.

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March 6, 1995

SUMMARY

Motorola, Inc. supports the following positions on satellite and terrestrial land mobile issues in connection with U.S. preparations for WRC-95:

Satellite Issues

- Change Footnote 731E specifying EIRP power density limits in the 1610-1626.5 MHz band to make clear that the density values contained therein are "mean" values.
- Suppress Footnote 733E on protection of the radio astronomy service as no longer necessary, but do not replace it with the protection rules adopted in the Big LEO proceeding.
- Make 1626.5-1631.5 MHz a generic MSS (Earth-to-space) allocation in Region 1 to match the Region 2 and 3 allocations.
- Delete the 1626.5-1631.5 MHz band from the scope of Footnote 726C concerning protection of GMDSS.
- Establish a co-primary MSS (Earth-to-space) allocation in the 1675-1710 MHz band in Regions 1 and 3 to match the Region 2 allocation.
- Delete Footnote 735A which effectively renders MSS secondary in Region 2 in the 1675-1710 MHz band vis-a-vis Metsats and Metaids.
- Allocate the 2010-2025 MHz band globally to MSS (Earth-to-space) to replace spectrum rendered unusable for MSS by the Commission's PCS band plan.
- Make the 2165-2170 MHz MSS (space-to-Earth) allocation a global rather than Region 2 allocation.
- Delete the MSS (Earth-to-space) allocation from the 1970-1985 MHz band.
- Maintain the current 2005 date-of-entry set forth in Footnote 746B for global use of the 2 GHz bands.

- Adopt the modifications to Resolution 46 on coordination of non-GSO MSS systems identified in paragraph 41 of the NOI, except for the one relating to ITU-R IS 847. Motorola also proposes certain language changes to further clarify Res 46.
- Consistent with recommendations of ITU-R Task Group 4/5, the 19.2-19.7/29.0-29.5 GHz bands should be designated for use by non-GSO MSS feeder links and RR 2613 should not apply to these bands.
- A new provision, RR 2504b, should be adopted establishing an EIRP limit of 24 dBW/MHz on Fixed Service systems transmitting more than 2 degrees above the horizon and operating in either the 29.0-29.5 GHz band, which will be used for MSS feeder links, or the 22.55-23.55 GHz band, which will be used for intersatellite links.
- Adopt the preliminary agenda for WRC-97, but modify section 3.1 to specify service as well as feeder links. Consideration of frequency allocations and regulatory provisions relating to non-GSO FSS systems should also be added to the agenda.

Terrestrial Land Mobile Issues

- The U.S. should not seek to accommodate Little LEO spectrum requirements by proposing to allocate, or conduct sharing studies in, spectrum now allocated for and heavily used by terrestrial land mobile systems, such as the 157-174 and 450-512 MHz bands.
- The agenda for WRC-97 should include consideration of additional allocations below 1 GHz for terrestrial systems providing public safety communications, particularly in the 380-400 MHz range.
- The agenda for WRC-97 should include consideration of an allocation in the 5.2 GHz band for high speed wireless data systems.

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In the Matter of

Preparation for International Telecommunication Union World Radiocommunication Conferences	))))	IC Docket No. 94-31

Comments of Motorola, Inc.

Motorola, Inc. ("Motorola") hereby offers its comments in response to the Federal Communications Commission's Second Notice of Inquiry ("Second NOI") released January 31, 1995 in the above-captioned proceeding.[1]

In its Second NOI, the Commission reaches a tentative conclusion in some areas concerning U.S. proposals for WRC '95. It seeks additional information relating to the WRC' 95 agenda, the recommended agenda for WRC '97, and the preliminary agenda for WRC '99.

I. SATELLITE ISSUES

On January 31, 1995, Motorola received authority to construct, launch, and operate the IRIDIUM® low-earth-orbit ("LEO") satellite system, which will provide mobile-satellite service ("MSS") using MSS spectrum in the 1610-1626.5 MHz band, combined with FSS spectrum in the 29.0-29.5 and 19.2-19.7 GHz bands for its feeder links. Consequently, Motorola, has a substantial interest in issues

[1] These comments are divided into satellite and terrestrial land mobile issues. It should be noted, however that the latter section also addresses issues involving allocations sought by "Little LEO" proponents.

that are on the agenda for WRC '95, and that might be considered at WRC's '97 and '99, concerning current and future MSS spectrum and associated feeder link allocations.

Motorola was one of three applicants that received authority from the FCC in January 1995 to construct a non-GSO MSS system operating in part of the 1610-1626.5 MHz band. The other two licensees are Loral/Qualcomm Partnership, L.P. (with respect to the Globalstar system), and TRW Inc (for the Odyssey system). In addition, it is possible that three other applicants, AMSC, Constellation and MCHI (formerly Ellipsat) whose applications were deferred by the FCC until January 1996, may also receive construction permits to use this spectrum.

During the MSS proceeding, Motorola sought 10.5 MHz of spectrum in the 1610-1626.5 MHz band to meet the IRIDIUM® business plan. It accepted the eventual assignment of a much smaller amount of spectrum for U.S. service (5.15 MHz from 1621.35-1626.5 MHz) because the possible alternative, spectrum auctions, would have been contrary to the public interest and unacceptable for a global MSS system, and because the IRIDIUM® system can meet the initial demand for service it anticipates in the U.S. with 5.15 MHz of spectrum. Nevertheless, 5.15 MHz of spectrum for use in the U.S. will not be sufficient spectrum for very long. Additional spectrum will clearly be important to meet anticipated future growth in demand for service from the IRIDIUM® system. This is probably also true for the other MSS licensees and applicants in the 1610-1626.5 MHz band.

To relieve the current congestion in the L-band and to facilitate implementation of recently licensed MSS systems, Motorola proposes that the following changes be made to the current MSS and feeder link allocations and

related regulatory provisions at WRC '95. In addition, certain modifications should be considered to the preliminary agenda for WRC '97.

(1) 1610-1626.5 MHz band: Modification of Footnote 731E. Motorola fully supports the Commission's proposal to change Footnote 731E in the ITU Radio Regulations to make clear that the EIRP power density values presented therein are "mean" values. However, the language proposed by the FCC to accomplish this objective adds the word "mean" only with respect to the EIRP power density value -15dB (W/4 kHz).[2] The word "mean" also needs to be added to the sentence that discusses the EIRP power density value -3dB(W/4 kHz). Thus, that sentence should read: "In the part of the band where such systems are not operating, a mean value of -3dB (W/4 kHz) is applicable."

(2) 1610-1626.5 MHz band: suppression of 733E. The Commission asks whether footnote 733E should be suppressed and replaced by the protection rules embodied in the Report and Order on Big LEOs.[3] Motorola supports the suppression of Footnote 733E as no longer necessary, but opposes replacing it with the protection rules in the Big LEO Report and Order. The rules negotiated in the Big LEO proceeding (which only pertain to MSS uplinks in the 1610-1626.5 MHz band) were site-specific. Although they may provide a good starting point for negotiations with radio astronomers in other countries, they are not necessarily universally applicable, and should therefore not be raised to the level of a regulatory requirement.

(3) 1626.5-1631.5 MHz band: Generic MSS allocation Since the band from 1626.5-1631.5 MHz is adjacent to the 1610-1626.5 MHz band, it is optimum

[2] Proposal No. 3/B - LEO, Appendix 1 at 7.
[3] Second NOI at ¶ 27.

spectrum for MSS systems employing the 1610-1626.5 MHz band to use for future growth. The U.S. should seek to make this 5 MHz of spectrum usable by all MSS systems.

The 5 MHz of spectrum from 1626.5-1631.5 MHz is currently allocated in Regions 2 and 3 to generic MSS. In Region 1, the band is allocated to MMSS on a primary basis and LMSS on a secondary basis. Motorola does not oppose the Commission proposal to upgrade the Region 1 MSS allocation in this 5 MHz, as well as the corresponding Region 1 MSS downlink allocation at 1525-1530 MHz, to a primary generic MSS allocation. However, it should be noted that if necessary, MSS systems can operate globally under the current allocation. In other words, this improvement is not critical in order for MSS systems to be able to use the band.

(4) 1626-1631.5 MHz band: Modify RR Footnote 726C by deleting the GMDSS requirement for this 5 MHz subband. Footnote 726C imposes GMDSS requirements on seven countries — five in Region 2 and two in Region 3 — that use the 19 MHz band (from 1626.5-1645.5 MHz) and the 14 MHz band (from 1530-1544 MHz) for primary MSS service. The footnote is designed to ensure that even when these countries use these bands for MSS generally, they continue to protect maritime mobile satellite safety-of-life services operating in these bands.

Now the Commission proposes to extend this same protection to any new band where the generic MSS allocation replaces the MMSS allocation. As a general matter, Motorola does not oppose this proposal. However, Motorola requests that the GMDSS requirement in Footnote 726C be deleted across-the-board for the 5 MHz band (from 1626.5-1631.5 MHz) so that the GMDSS requirement would not be imposed on this 5 MHz with respect to the seven

countries to which it already applies and any other to which it may be applied either in Region 1 or elsewhere in Regions 2 and 3.

There are excellent public interest reasons to remove the subband 1626.5-1631.5 MHz from the scope of Footnote 726C. First, GMDSS is not currently being provided in this 5 MHz. Second, the limited applicability of the GMDSS requirement in this band renders it valueless as a safety-of-life service. It is not applicable in Regions 2 and 3 except in the vicinity of seven countries. In addition, the Table of Allocations does not similarly restrict the downlink band (1525-1530 MHz) with which this band is paired.

Motorola proposes that the GMDSS requirement be eliminated only from the 5 MHz from 1626.5-1631.5 MHz, not from the 1631.5-1645.5 MHz band. The requirement would continue to remain in place for the 1631.5-1645.5 MHz band as well as for the downlink band that is paired with it from 1530-1544 MHz. 28 MHz is more than enough spectrum to meet the needs of maritime distress and safety communications.

Footnote 726C today effectively prevents systems other than Inmarsat from using the 1526.5-1531.5 MHz band to provide MSS. This is very much against the public interest. Inmarsat already has access to 68 MHz of spectrum, which it currently uses very inefficiently. It serves approximately 35,000 users in all this spectrum. By contrast, the IRIDIUM® system, with only 5.15 MHz of spectrum initially, expects to accommodate over a million subscribers. Other non-GSO MSS systems claim similar efficiencies. Given the scarcity of MSS spectrum, and the inefficiency with which Inmarsat is using the spectrum it is currently registered to use, the 5 MHz of spectrum from 1626.5 to 1631. 5 MHz should be made available for use by competitive MSS systems, by deleting it from the scope of the GMDSS requirement in Footnote 726C.

Consequential amendments to the Radio Regulations should also be proposed to ensure that GMDSS will not be required in this subband in Region 1.

(5) 1675-1710 MHz band: Co-primary MSS allocation in all ITU regions. The 1675-1710 MHz band is currently allocated for MSS uplinks only in Region 2. Motorola supports the Commission's proposal to extend this co-primary allocation to Regions 1 and 3.[4]

(6) 1675-1710 MHz band: Delete Footnote 735A. Although nominally a co-primary service, MSS is effectively rendered secondary in Region 2 by virtue of RR Footnote 735A, which states that MSS shall not cause harmful interference to, or constrain the future development of, the Metsat/Metaids service. In the Second NOI, the Commission proposes that "if appropriate sharing criteria" are developed and approved between MSS and Metsats, or between MSS and Metaids, this footnote could be modified to eliminate MSS's secondary status in Region 2 with respect to Metsats, or Metaids, or both[5].

Motorola urges that Footnote 735A be suppressed because it is unnecessary to protect current Metsat and Metaid systems beyond their current co-primary status. Moreover, to continue to provide unconditional super-primary status to future Metsat and Metaid systems is counter-productive to efficient use of the spectrum. The super-primary status for future systems will not encourage developers of such systems to employ spectrum-efficient techniques. In fact, just the opposite will be true. Unless Footnote 735A is deleted, future Metsat and Metaids systems may well be developed using techniques that inhibit fair

[4] Second NOI at ¶ 61.
[5] Second NOI, p. 14, n.39.

sharing of the spectrum and thereby avoid the inconvenience of coordinating with MSS systems. This "temptation" should be removed from the Radio Regulations by deleting Footnote 735A.

It has been agreed in WP7C (WP 7C/Temp/4 (Rev. 2)) that Metsat systems do not use some frequencies in the 1675-1710 MHz bands and Metsat systems' use of other frequencies in the band needs to be protected only within 40 Km of a few data collection earth stations such as at those Wallops Island, VA, and a few sites in Europe, Russia and Japan. Co-primary status alone is sufficient to protect these sites. Therefore, at least with respect to Metsat systems, Footnote 735A should be deleted.

Protection of Metaid systems (i.e., radiosondes) in the 1675-1700 MHz band is more complicated but there is no reason to believe the band cannot be shared. In most of the world, the band is very lightly used by radiosondes, if at all. Only 20 percent of radiosondes in the world today employ this band. (The other 80 percent of radiosondes in the world use the 400 MHz band.) Moreover, more than half of this usage is in the U.S. and other nations in Region 2 whose use of radiosondes is subsidized by the U.S. government. Thus, it is readily seen that use of the 1675-1700 MHz band for radiosondes outside Region 2 is quite small. Therefore, it seems reasonable to believe that sharing this band between MSS and Metsat systems should be much simpler in Regions 1 and 3 than it is in Region 2.

As WP7C has indicated in recent Liaison Statement (7C/Temp/__), WP8D sharing studies will be undertaken between Metaid and MSS services. There is no reason to expect that such studies will not be fruitful and that Footnote 735A cannot be deleted with respect to Metaid systems as well.

(7) 2 GHz band: Changing the MSS allocation. WRC '92 allocated 40 + 40 MHz in the following 2 GHz bands for MSS on a primary basis:

Reg 2: 1970-1980 MHz (Earth-to-space)/2160-2170 MHz (space-to-Earth)

Global: 1980-2010 MHz (Earth-to-space/2170-2200 MHz (space-to-Earth)

After WARC '92, the Commission decided to allocate the 1970-1990 MHz band domestically to terrestrial PCS. This action effectively rendered 20 MHz of uplink spectrum useless for MSS in the U.S. and orphaned the corresponding downlink (2160-2180 MHz).

The U.S. should seek to find spectrum for global MSS systems to replace that which was rendered unavailable by the FCC's PCS decision. The demand for MSS spectrum is at least as great now as it was in 1992, and non-GSO MSS licensees and applicants in the 1610-1626.5 MHz band need to be able to use the 2 GHz band beginning sometime after the year 2005 (after the spectrum becomes available for global MSS use) for next generation systems. Indeed, applications and petitions have already been filed with the FCC to use this spectrum for MSS.

For these reasons, Motorola supports the FCC's proposal that the following changes be made at WRC '95 to the 2 GHz band MSS allocation:[6]

- Allocate the band 2010 -2025 MHz to global MSS (Earth-to-space);
- Expand the 2165-2170 MHz (space-to-Earth) band from a Region 2 allocation to a global (Regions 1,2,3) allocation; and
- Delete the MSS uplink allocation from the 1970-1985 MHz band.

The net result of these changes would restore the allocation of 40 + 40 MHz (1985-2025 MHz (Earth-to-space)/2160-2200 MHz (space-to-Earth) at 2 GHz for global MSS use.

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[6] Second NOI, Table 5 and ¶ 62.

(8) 2 GHz band: Advancing the date of entry-into-force of the MSS allocation. Currently (pursuant to Footnote 746B), the regional and global MSS allocations at 2 GHz (1970-2010 MHz/2160-2200 MHz) enter into effect on January 1, 2005, everywhere in the world except in the U.S., where (by virtue of Footnote 746C) they enter into effect nine years earlier, on January 1, 1996. The FCC proposes that the new 2 GHz allocation should also be subject to Footnotes 746B and 746C.

Motorola believes the date-of-entry for global use of the current 2 GHz MSS band should remain at 2005. The 2005 date was selected to protect current FS operations in the band, and Motorola believes that nothing has occurred in the intervening period since 1992 to change the validity of that rationale.

One argument that is made by other countries in favor of advancing the global date is that somehow U.S. systems will gain a "headstart" on the rest of the world because of Footnote 746C. Motorola has difficulty understanding how, as a practical matter, an MSS system could provide service over the U.S. pursuant to Footnote 746C prior to 2005. The footprint of any such system would have to impinge on the territories of (at least) Canada and Mexico, whose fixed service operations are entitled to protection until the global date for the MSS allocation takes effect (i.e., until 2005). Because of Footnote 746B, Canadian and Mexican fixed service systems would have an absolute right to protection in bilateral negotiations or from the ITU. As a practical matter, therefore, there does not seem to be any basis for the concern expressed by other countries in this regard.

(9) Resolution 46 Changes. The Commission (Second NOI at para. 44) requests proposals for a comprehensive "package" of Resolution 46 changes.

As an initial matter, Motorola believes Resolution 46 should be modified as a stand-alone document, even if it is later incorporated into the VGE simplified regulations. Common sense suggests that it is much easier to work with the interrelated provisions in Resolution 46 while they are integrated into a simple comprehensive document than it would be after they are dispersed in the VGE report.

Second, Motorola supports all but one of the changes to Resolution 46 identified by the Commission in paragraph 41 of the Second NOI. In particular, Motorola supports:

- Adopting different PFD thresholds to replace those contained in RR 2566 for specific bands identified by TG 2/2;
- Modifying RR 731E to specify that the maximum EIRP density limits are based on the use of "mean" (as opposed to "peak") values;
- Modifying Section 2.5 of Resolution 46 (coordination with terrestrial services) with a new methodology to be used to avoid coordination with terrestrial services if the PFD limit is not exceeded;
- Modify Section 2.1 of Resolution 46 to provide a specific method to calculate coordination regions which would identify affected assignments with which coordination should take place.

However, Motorola does not support the last FCC proposal in paragraph 41, namely, revising Note 1 of Resolution 46, Section III, by replacing the current definition of "coordination area" with a new methodology contained in recommendation ITU-R IS 847. ITU-R IS 847 is not currently applicable to

handheld satellite subscriber units. (By contrast, ITU-R IS 850 could be used for feederlinks). This idea expressed in ITU-R IS 847 may have validity, but the recommendation needs to be reworked before the U.S. proposes that it be incorporated in Resolution 46.

In addition, Motorola also proposes that Section 2 of Resolution 46 should be changed to state that if an Administration does not respond to publication of notice within six months, it is deemed to have agreed to the proposal. This is what the VGE simplified regulations state. This view is also supported by the French Administration in a submission to the Working Party of the CPM in January 1995 (see Document 17, p. 19, Add. 5).

Motorola believes that the Commission's statements in paragraph 42 of the Second NOI are correct, and that non-GSO MSS applicants should provide the information the Commission has identified as missing from current Appendix 3 in connection with their current Appendix 3 filings.

In addition, Motorola believes that Article S9.29 and S9.30 of the VGE Report lack clarity and should be replaced with a simple text which says "when an Administration wishes to notify a system, it shall either (a) send copies to all countries or (b) send a copy to the Radiocommunication Bureau ." TG 8/3 has recommended to the CPM (Doc. TG 8/3-Temp/64) that the Resolution 46 method is the preferred method for notifying non-GSO systems under S9.30. The above text reflects that recommendation.

(10) Feeder link issues: Modify RR 2613 Applicability. As the Commission points out, TG-4/5 identified potential approaches for accommodating non-GSO MSS feeder links in specific frequency sub-bands in FSS allocations above 17.7 GHz.[7] Two options are identified in the TG 4/5

[7] Second NOI at ¶ 49.

document (ITU-R Document 4-5/Temp/32 (Rev. 1)-E at 3) referenced by the Commission. Motorola endorses the second of these two options. This option, which is also described in the draft CPM report, proposes (at Chapter 2, Part C, Sect. 3.5.1 at 3d para; p. 52) that RR 2613 would not be applied in specific identified bands, including the 19.2-19.7 and 29.0-29.5 GHz band. Existing GSO systems would have equal status with non-GSO systems in these bands, but future GSO systems would need to protect non-GSO MSS feederlinks.

The specific language that Motorola proposes for adoption is provided in Attachment 1 hereto[8]. It is recommended that the U.S. propose this language for the bands 19.2-19.7 GHz and 29.0-29.5 GHz.

(11) Feeder Link issues: Establish EIRP limits on FS operations. In addition to the issues identified by the Commission concerning feeder links, Motorola proposes that a EIRP limit of 24 dBW/MHz be imposed on fixed service (FS) systems transmitting more than 2 degrees above the horizon and operating in the band 29.0-29.5 GHz. Currently, Article 27, RR 2505 limits the power of fixed service systems at 55 dBW. While this limit is acceptable for FS antennas in the 29.0-29.5 GHz band pointing less than two degrees above the horizon, an EIRP limit of 24dBW/MHz should be imposed on such antennas while they are transmitting two degrees or more above the horizon. A similar limit is already

[8] On a related matter, Iridium has two comments on Table 2 of the Commissions's Second NOI, (entitled "Candidate Bands for NGSO MSS Feeder Link Spectrum") (Second NOI at pp 27-29). First, the table indicates that with respect to the 19.2-19.7 GHz band, bi-directional sharing (i.e., reverse band working) is possible. No studies have demonstrated to the satisfaction of Iridium that this is feasible in this band, and it is premature to draw these conclusions. Second, note 12 to the table states that "the most logical" 500 MHz to be paired with the 19.2-19.7 GHz band from the 2000 MHz within the 27.5-29.5 GHz band is the 500 MHz from 29.0-29.5 GHz. Iridium concurs with this assessment and strongly opposes consideration of any other 500 MHz for pairing with the 19.2-19.7 GHz band. The IRIDIUM® system has been designed to use feeder link frequencies within these particular band segments (i.e., 19.4-19.6/29.1-29.3 GHz) on the basis of global spectrum occupancy in order to facilitate coordination around the world. In fact, the international coordination of this spectrum for the IRIDIUM® system has been in progress for well over two years. See CC Docket No. 92-297, NRMC-32 (August 5, 1994). Thus, any change in the IRIDIUM® system frequency plan at this juncture would cause substantial delays in the ITU coordination process and require significant redesign efforts, with corresponding delays in the initiation of service to the public.

imposed on fixed service systems to protect GSO systems (See RR 2504(a)). A new provision, RR 2504 (b), should be added to extend similar protection to non-GSO systems. Such a proposal is currently under consideration in IWG-4 and has been included in the CPM draft report at Chapter 2, Part C, Section 3.6.3; p. 55.

(12) Intersatellite Link Issues. For the same reasons presented above with respect to protection of non-GSO intersatellite links from interference from co-frequency FS systems, the same restriction (an EIRP limit of 24 dBW/MHz for fixed service antennas transmitting more than two degrees above the horizon) should be adopted for fixed service systems operating in the intersatellite allocation from 22.55-23.55 GHz.

(13) WRC '97 Issues. Motorola endorses maintaining Resolve 3.1 of the preliminary agenda for WRC '97. This provision permits the Radio Regulations to be revised as necessary at WRC '97 with respect to pressing issues concerning MSS frequency allocations, including allocations for feeder links. However, Section 3.1 of the WRC '97 preliminary agenda should be modified to specify MSS service links as well as feeder links. Thus Section 3.1 should be modified to read: "unresolved and other pressing issues concerning frequency allocations and regulatory aspects as related to the mobile-satellite services, including allocations for service links and feeder links for mobile satellite services as appropriate."

In addition, Motorola would like to see the issue of frequency allocations and regulatory provisions relating to non-GSO fixed satellite services (as opposed to non-GSO MSS feeder links) added to the agenda for WRC-97, but opposes having it considered at WRC '95.

Considering this issue at WRC-95 would be inappropriate and counter to U.S. interests for three reasons. First, as the Commission recognizes in footnote 13 of the NOI, "feeder link issues here are germane only to MSS Between 1 and 3 GHz." It is clear from the agenda for WRC-95 that the intent of item 2.1(c) on feeder links relates back to item 2.1(a) concerning MSS allocations below 3 GHz. Consideration of issues pertaining to non-GSO FSS systems was never contemplated in establishing the agenda for WRC-95. Second, the necessary sharing studies have not been fully vetted nationally or in ITU Study Group 4. Finally, consideration of non-GSO FSS issues at WRC-95 would undermine more than two years of work that TG 4/5 has done on non-GSO feeder link issues and, more importantly, would jeopardize the ability of recently licensed non-GSO MSS systems to secure adequate feeder link spectrum and initiate service to the public in a timely manner. Thus, non-GSO FSS issues should instead be placed on the agenda for WRC-97, by which time they should be ripe for consideration.

II. TERRESTRIAL LAND MOBILE ISSUES

The Second NOI asks for public comments on potential additional spectrum allocations for little LEOs (NVNG MSS).[9] Several bands are identified in the IAC report for this purpose and are divided into categories Priority One, Priority Two, and Lowest Priority. Among the bands listed by the IAC are 387-399.9 MHz (Priority One), and the 157-174 MHz and 450-512 MHz bands (Priority Two). The latter two bands also have recently been a subject of consideration at the U.S. preparatory meetings for the upcoming CPM.

Motorola submits that the above-listed bands are poor candidates for additional Little LEO spectrum. As explained below, the non-government land

[9] Second NOI ¶ 57.

mobile bands near 150 MHz and 450 MHz are exceedingly heavily utilized, could not easily be shared with mobile satellite systems, and will be unable to support their existing terrestrial users by the time Little LEO systems are launched. Moreover, certain spectrum near 400 MHz should be considered by the Commission for inclusion in proposals for WRC-97 for additional allocations for terrestrial land mobile systems for public safety applications.

A. The United States Should Not Propose To Allocate, or Conduct Sharing Studies in, Spectrum Now Allocated For and Heavily Used By Terrestrial Land Mobile Systems

The IAC report identified several candidate bands for additional Little LEO spectrum.[10] In general, the Little LEO proponents favor bands that are allocated in all three ITU regions for either fixed or mobile service, thus simplifying global allocations and operations. In informal meetings of IWG-2 and the conference preparatory process, the terrestrial land mobile community noted that, while it did not object to additional allocations for Little LEO, the Commission -- and the Departments of State and Commerce -- should consider the burdens on incumbent licensees when identifying potential future spectrum for Little LEOs. Specifically, terrestrial land mobile interests and licensees objected to examination of spectrum between 153-157 MHz and 450-512 MHz and these objections led in part to such bands being downgraded to Priority Two for additional NVNG MSS spectrum.[11]

The terrestrial land mobile community has good reasons to argue that these bands are inappropriate for sharing with MSS. The bands listed are the primary terrestrial private land mobile service bands allocated in the United

[10] It is important to note that the additional allocations are championed, in the main, by entities in the "second round" of Little LEO applicants. As a practical matter, those Little LEOs already licensed will be able to exclude any second round licensees from the spectrum near 150 MHz and 400 MHz already allocated by the agency. Thus, this impetus to obtain additional spectrum is prompted by applicants that are not now -- and may never be -- Commission licensees.

[11] In the United States, the private land mobile radio services (PLMRS) are allocated spectrum between 150 and 174 MHz, although Little LEO interests sometimes focus only on a subset of this band.

States. As Motorola has previously noted, these bands are "the most heavily utilized frequency bands regulated by the FCC"[12] with over 12 million licensed transmitters.[13] The Commission is well acquainted with this environment. In its *Refarming Proceeding*, the Commission stated that "[w]e are convinced that, without significant regulatory changes in the bands below 512 MHz, the quality of PLMRS communications will likely deteriorate to the point of endangering public safety and the national economy."[14] Clearly, these realities do not support the examination of additional sharing of these critically important bands.[15]

As noted, these bands are not only heavily used, they serve important public interest needs. Most importantly, public safety agencies make intense use of this spectrum for, *inter alia,* the Local Government Radio Service,[16] the Police Radio Service,[17] the Fire Radio Service,[18] the Emergency Medical Radio Service,[19] other medical and rescue organizations,[20] disaster relief organizations,[21] and lifeguards.[22] These radio services literally help to save lives; sharing with MSS could imperil these services and, perhaps, undermine the ability of professionals to safeguard the public. In addition to meeting safety of life and property needs, the use of these bands by a wealth of other users

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[12] Comments of Motorola, PR Docket 92-235, at 6 (filed May 28, 1993).

[13] Spectrum Efficiency in the Private Land Mobile Radio Bands in Use Before 1968, 6 FCC Rcd 4126 (1991). In fact, the AAR has indicated that this number is closer to 16 million. Contribution by the Association of American Railroads Regarding Certain Proposed Modifications to the Draft Consolidated CPM Report to the WRC-95, at 2 (Feb. 24, 1995).

[14] *Replacement of Part 90 by Part 88*, 7 FCC Rcd 8105 (1992).

[15] Furthermore, the FCC's *Refarming Proceeding* is intended to adopt policies that intensify the use of these bands by private land mobile systems, making the opportunity for MSS to share even more unlikely. The Commission appears to be relying upon such refarming of the primary private land mobile bands below 512 MHz to help satisfy some of the increasing demand for spectrum by the private land mobile community including public safety users. *See Report and Plan of the Federal Communications Commission: Meeting State and local Government Public Safety Agency Spectrum Needs Through the Year 2010* (Feb. 9, 1995).

[16] *See* 47 C.F.R. § 90.17(b) (1993).

[17] *See* 47 C.F.R. § 90.19(d), (f) (1993).

[18] *See* 47 C.F.R. § 90.21(b) (1993).

[19] *See* 47 C.F.R. § 90.27(b) (1993).

[20] *See* 47 C.F.R. §§ 90.35, 90.37 (1993).

[21] *See* 47 C.F.R. § 90.41 (1993).

[22] *See* 47 C.F.R. § 90.45 (1993).

contributes substantially to the social and economic well-being of the country. For example, these bands are used by countless entities to support day-to-day operations of their businesses: power utilities,[23] petroleum companies,[24] railroads,[25] taxicabs,[26] tow trucks,[27] as well as general business users.[28] Service degradation to these channels could impair the communications capabilities of such companies, thus affecting U.S. competitiveness and American jobs.

Neither the Second NOI, the IAC, nor the U.S. CPM process has educed any factual basis to believe that this spectrum could be shared with NGO MSS. The already intense sharing among authorized terrestrial users has been possible because of arrangements worked out between the FCC and one or more of the private land mobile frequency coordination groups. Such sharing is already difficult; sharing with non-geostationary satellite systems would be extraordinarily complicated. In fact, most of the 150 MHz band involves *unpaired* simplex spectrum, meaning that it would be impossible to isolate channels for MSS use that are without co-frequency fixed terrestrial receivers. This would make sharing even with lower power MSS satellite subscriber units virtually impossible.

Indeed, the IAC's view on the feasibility of sharing appears to be based on the misconception that current land mobile use of these bands is "intermittent." While this may be true for individual users, when viewed over a larger area, any given channel is in nearly constant use.[29] Because of the numerous overlapping terrestrial service areas and the size of the satellite downlink "footprint," even

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[23] *See* 47 C.F.R. § 90.63 (1993).
[24] *See* 47 C.F.R. § 90.65 (1993).
[25] *See* 47 C.F.R. § 90.91 (1993).
[26] *See* 47 C.F.R. § 90.93 (1993).
[27] *See* 47 C.F.R. § 90.95 (1993).
[28] *See* 47 C.F.R. § 90.75 (1993).
[29] While limited opportunities for channel exclusivity exist in the frequency band 470-512 MHz, for the most part, private land mobile users are required to share frequencies in the 150 and 450 MHz bands. It is quite common for more than twenty different business radio users to be assigned to a given channel in a major metropolitan area.

short "bursty" communications would likely interfere with co-frequency terrestrial transmissions within line of sight.

For these reasons, preliminary examinations of sharing discussed at last summer's Toronto meeting of ITU-R 8/3 noted the potentially "conflicting" uses of terrestrial spectrum that might preclude additional MSS allocations.

> At present, many of the existing allocations for the land mobile services are becoming more and more extensively used in many countries. The growth of terrestrial cellular mobile networks and other high density land mobile applications will make the relevant bands difficult to share between land mobile services and the MSS. Administrations should take into consideration that the conflicting spectrum requirements have to be balanced with respect to both services.[30]

Study Group 8/3 also recommended examination of "other" as yet unidentified mobile bands (outside of the existing PLMRS allocations) as better sharing candidates.[31]

All these factors suggest that the U.S. should not be tempted to identify current terrestrial mobile bands for possible examination in the next ITU-R study cycle. While it may be attractive to proffer specific spectrum suggestions to further the debate and narrow any sharing studies, these target bands are so heavily used that sharing is likely to prove impossible. Identifying these bands, therefore, would necessitate further rounds of study and diplomacy, and would actually *delay* additional allocations for Little LEOs, certainly beyond WRC-95.

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[30] ITU-R SG 8/3, Doc. 8-3/18, at 13 (July 27, 1994).
[31] ITU-R SG 8/3, Doc. 8-3/17, at 8 (July 27, 1994)

For all these reasons, the IAC assigned the 153-157 MHz and 450-512 MHz bands only Priority Two. Motorola respectfully submits that if any bands are to be studied by the ITU-R as potential additional Little LEO allocations, the bands identified by the applicants themselves as most clearly suited for additional MSS allocations -- listed as Priority One -- are the ones which should be examined.[32] Given the fact that the private land mobile bands already are too limited to meet the needs of existing users, it clearly would not be a fruitful exercise to study the feasibility of Little LEOs sharing those bands.

B. The United States Should Seek Additional Spectrum below 1 GHz for Terrestrial Systems Providing Public Safety Communications

In light of the clear shortage of spectrum allocated for and used by terrestrial land mobile systems, the U.S. should not merely oppose attempts by Little LEO proponents to gain access to private land mobile spectrum. Rather, the United States should actively seek additional terrestrial spectrum at upcoming WRCs. In particular, the United States should support efforts to find further spectrum in a commercially practical range, for such uses.

One of the most crucial needs for additional frequencies for terrestrial land mobile systems is for public safety communications. Public safety communications are already filled to over capacity in the United States; outside North America, the situation is also becoming serious. Globally, there is a shortage of available public safety frequencies that can be used for medical, rescue and natural disaster communications, particularly in developing nations with nascent infrastructure. Additional radio capabilities would have been useful, for example, during the recent severe flooding in north-central Europe.

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[32] The Priority One bands include the 387-399.9 MHz band. As discussed below, Motorola favors an allocation in the 380-399.9 MHz range for terrestrial land mobile systems providing public safety communications.

Most such allocations normally are addressed at a national level as opposed to regionally or internationally. Recently, however, it increasingly has been recognized that significant benefits in public safety communications can be derived through international standardization of terrestrial use of land mobile services spectrum allocations. In particular, global allocations will permit: (1) countries to gain economies of scale by having manufacturers develop equipment and technologies suitable for much large markets; and (2) where permitted, mobile operation in bordering countries can achieve interoperability of communications. This latter point is particularly important to entities meeting public safety needs, whose emergency requirements often traverse national boundaries.

In the IAC process, the Telecommunications Industry Association (TIA) has proposed that the U.S. submit proposals designed to secure attention to this question at WRC-97. In particular, as the FCC notes,[33] TIA has focused on the band 380-399.9 MHz for terrestrial land mobile systems providing public safety applications. Fortunately, the spectrum is already allocated in all three ITU regions for mobile use. This drastically simplifies what will be required; TIA has recommended that the U.S. seek resolutions and footnotes that "identify" particular spectrum as being well suited for public safety use and commend to Administrations its use for those purposes.

Motorola fully supports TIA's efforts. Bands below 1 GHz have the advantage of good propagation characteristics for terrestrial mobile use and are close to existing allocations, potentially reducing the costs of manufacture and use of receivers and transmitters. The spectrum shortages already present will grow particularly acute by the beginning of the next century, making this a timely topic for WRC-97.

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[33] *See* Second NOI, ¶ 98.

Motorola supports allocation of suitable spectrum for all private users, including Public Safety. [34] The 380-399.9 MHz frequency band is particularly appropriate for public safety use. In many countries, this band is allocated for governmental use; throughout Europe and North America, the band is used by NATO for tactical communications. NATO recently has agreed to share the 380-385 MHz and 390-395 MHz bands with terrestrial public safety communications.[35] And, as the FCC acknowledges,[36] several European nations have also proposed to license all or portions of this band for terrestrial land mobile systems for public safety communications.

Rarely does an existing user of scarce spectrum agree to share its band with others; rarely -- at least recently -- are the allocation policies of the U.S and the European Union fully consistent. Taken together, these trends represent a uniquely painless opportunity to assure additional spectrum for a valuable and needy service.

Motorola is aware that some Little LEO applicants would also like to secure this band for MSS. Motorola submits, however, that this represents a particularly poor choice, for two reasons. First, NATO has already agreed to share much of the band with terrestrial land mobile public safety services, not with mobile satellite systems. Second, it is far from clear that MSS systems could share with the existing governmental use.

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[34] The Coalition of Private Users of Emerging Multimedia Technologies (COPE) filed a Petition for Rule Making in December 1993 seeking 75 MHz of spectrum to support communications systems for crime control, energy conservation and management, health care, pollution control, and industrial productivity. COPE targeted federal spectrum being transferred, e.g. 1710-1755 MHz, as a partial solution to the requirement. Motorola also supports that initiative.

[35] *See* NATO Unclassified Memo from Colonel M. Tange, ARFA-C(94)-1982L-SPA/530/1 (Nov. 30, 1994) (attached hereto as Attachment 2). The NATO plan provides for a transition into the 380-385 and 390-395 MHz portion of the band.

[36] See Second NOI, ¶ 57 n.88.